

1.0 Project Work Plan

The CS team has developed an approach for the Southeast RTP that will deliver a consistent method to support this and other RTPs to be conducted across Arizona. Our evaluation framework will build off of available data and analysis tools to prepare an accurate description of population, economic, land use growth; passenger and freight travel demand; existing and future transportation system conditions; and transportation system needs and deficiencies.

The ultimate product of this process will be a cost-effective assessment and prioritization of projects that best meet the transportation system performance needs of ADOT and the region. The analysis will be performance-based, the foundation of which will include local and regional issues, HERS-ST and other analytical tools to assess cost-effectiveness, and remain consistent with the performance-based planning process begun as part of the MoveAZ Plan. Projects will be identified for more detailed analysis and potential inclusion in the update of the next MoveAZ Plan.

The CS team's approach and detailed work plan for the Southeast RTP centers on several key issues, including:

Developing a blueprint RTP evaluation framework – The CS team will work with ADOT to develop a consistent, comprehensive, and flexible blueprint that will guide the development of the Southeast and future RTPs. ADOT and the consultant team will develop a blueprint, with input from and review by partner agencies. It is vital that this blueprint be flexible enough to consider the differences between the transportation characteristics and the availability and use of data and analytical tools between each region to be studied. Criteria, such as degree of urbanization in the study areas, presence of key through routes, and others will be used to help ADOT determine the appropriate data and tools to use for each profile. Elements of the framework will include, but not be limited to:

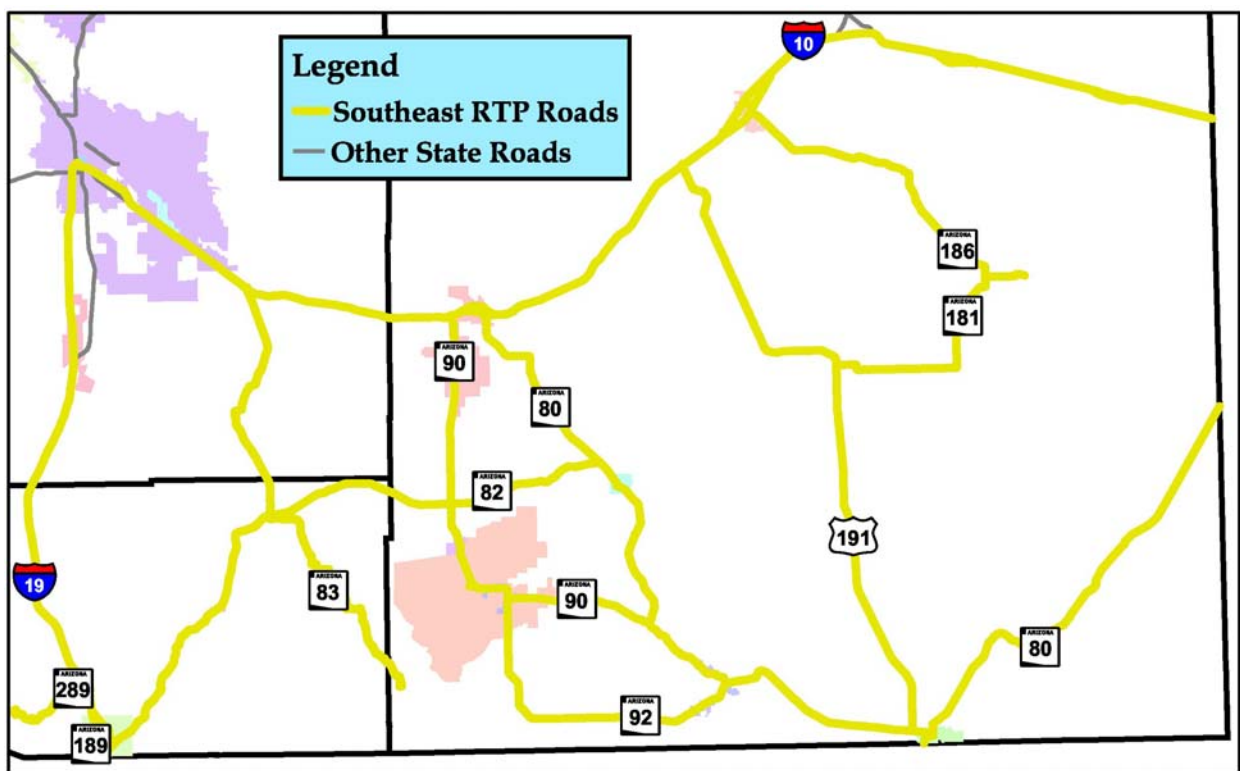
- **Data and data formatting.** Highway Performance Monitoring System (HPMS) data is the key input into the HERS-ST model. Formatting this data appropriately for use in the RTP process will be an important element of the template. Other transportation data, including GIS layers, will also be an important part of these profiles. ADOT current has standards for these data items that will be used by the RTPs.
- **Travel demand modeling.** Regions with urban areas or the potential for route choice and diversion will require more sophisticated models to help understand travel patterns. More rural areas may not require as sophisticated a model, but would benefit from improved estimates of trip generation. A modeling template would identify the appropriate level of modeling for a given profile, as well as the necessary socioeconomic and transportation data required to support the analysis.

- **Tools.** HERS-ST will be the backbone of the RTPs. HERS-ST must be tailored to fit the needs of Arizona, and of specific profiles. Other cost-effectiveness tools, such as new HERS-ST ITS and Operations evaluation techniques currently under development by CS and/or the use of the ITS Deployment Analysis System (IDAS) techniques, will be integrated into this framework to better assess operational improvements. Techniques similar to those developed for the MoveAZ Plan could be used to assess alternate mode needs and projects. The template will provide a set of criteria to help ADOT identify technical tools that can be introduced to the HERS-ST foundation to better assess key regional issues and also to support selected performance measures.
- **Performance factors and measures.** The RTPs will extend performance-based planning into the examination of needs and deficiencies. The MoveAZ plan set a clear direction for the use of performance-based planning in Arizona by identifying clear goals, objectives, and performance factors for the State. For the RTPs, the blueprint will need to identify recommended factors and measures to capture deficiencies across a wide variety of conditions. HERS-ST will supply most of the measures for this template, though in some areas, additional measures may be required. The blueprint will provide a matrix of all potential measures, including HERS-ST measures, and the appropriate situations in which to apply these measures.
- **Performance thresholds.** A key piece of the technical analysis includes identifying deficiencies on the state system. Tools like HERS-ST use thresholds to help determine when a given roadway segment is deficient. The template should include deficiency tables for HERS-ST and other tools that can be adapted to the specific conditions of each RTP.
- **Project identification.** Guidelines to define projects for evaluation need to be consistent with the project bundling process developed for the MoveAZ Plan. This will ensure that project evaluations are based on not only satisfying the needs and deficiencies identified in earlier analysis steps but to also ensure that the project solution impacts are measurable and meaningful.
- **Cost estimation.** Consistent cost estimation techniques will be designed and implemented to provide ADOT with a consistent process for identifying planning level costs for all projects that then feed into the MoveAZ Plan update. This will avoid inconsistencies of approach and also be used to support the available funding levels expected to be available for each Profile.
- **Issues for consideration.** Each RTP will focus on specific issues for the given study area. Though it is impossible to identify these issues up front for all studies, it is possible to provide a checklist of select important issues, including freight and goods movement, border crossings, population growth, and others. The blueprint could include such a checklist along with key triggers that indicate the importance of a particular issue.

The elements of this evaluation framework will serve as a template for all Regional Transportation Profiles, with the appropriate elements used for the Southeast RTP as dictated by availability of data, tools, and other local and regional considerations.

Focus on state transportation system corridors and routes – Approximately 670 miles of state highways will be studied in the Southeast RTP (Figure 1.1). Each state highway will be evaluated to identify needs, deficiencies, and improvement priorities.

Figure 1.1 Southeast RTP Study Routes



The following routes will be identified for special focus:

- West side of I-19 between Rio Rico Drive and Ruby Road; and
- Union Pacific Railroad in downtown Nogales due to possible safety, traffic circulation disruption, and community concerns.

Multimodal corridor considerations. The CS team will evaluate and identify multimodal needs and deficiencies and the performance of project solutions associated with state highways. Of particular importance will be an evaluation for relocation of the Union Pacific Railroad in Nogales. The need to relocate the railroad from the downtown area

has been identified for years but relocation alternatives are complex. For example, relocation costs are significant and would require public sector funding; relocation of the railroad would require relocation of rail inspection facilities; relocation would require commitments by the Mexican government and the Mexican railroad concessionaire; and alignment alternatives include relocation to the east and west of Nogales with eastern alternatives subject to significant environmental impacts and western alternative subject to significant engineering challenges. Other multimodal issues that will be considered in the study include bicycle use on interstate and non-interstate highways, pedestrian volumes in urban areas, shuttle bus call boxes maintained by ADOT on I-10 in Pima and Santa Cruz counties, trail crossings of state highways, and multimodal components of regional and small area transportation plans.

Implementation of an inclusive public and stakeholder involvement program. The implementing of an extensive and inclusive public and stakeholder involvement process to engage partners and all stakeholders in building consensus on regional needs, as well as project strategies, will be a goal of ADOT in this study. We will continue with this philosophy that both CS and Kimley-Horn have followed for Arizona-specific projects to match ADOT's desire to obtain this critical feedback to provide legitimacy to the planning process.

Task 1. Refine Work Plan and Develop Evaluation Framework

Objective

Refine the detailed work plan, schedule, and budget of the study including preparation of the project management plan, detailed public and stakeholder involvement process, and the design of the evaluation framework.

Approach

The CS team will refine the Southeast RTP work plan, including the schedule and budget for all tasks, to ensure that the objectives of ADOT and the Technical Advisory Committee (TAC) will be met. We propose that, in addition the TAC, the study include an evaluation framework input team that will provide guidance in the development of the evaluation template. This input team will be made up of representatives of ADOT and partner agencies across the State, including representatives of the Southeast RTP TAC. Other critical work plan tasks required for refinement will include:

- Designing the public and stakeholder involvement process, including implementing activities and events from the start to the finish of the study schedule, and newsletters, outreach events and media activities, contact lists, and a study web site will be prepared for the study (detailed public and stakeholder procedures are presented in Task 4).

- Defining the evaluation framework blueprint for the RTPs, including considerations of available data and tools; travel demand forecasting models; performance factors, measures, and thresholds; HERS-ST, regional, and cost-effectiveness analysis tools; additional tools to assess ITS and operational and multimodal (or non-highway) strategies; guidelines to prepare project bundles to measure and identify meaningful system performance results and potential for cost-effective project priorities; and consistent cost estimation techniques.
- Defining the product of the RTP to focus on a cost-effective assessment and prioritization of projects that best meets the transportation system performance needs of ADOT and the region. This product will be based on local and regional issues, HERS-ST and other analytical tools, cost-effective projects and strategies, and consistency with and promotion of projects in the MoveAZ Plan update.

Early in the study, we will meet with ADOT and the TAC to resolve any key technical and institutional issues that may impact the preparation and schedule of the study. We will also meet with ADOT and the evaluation framework input team to clearly define the planning process to be used for this and subsequent RTPs. Though there will be obvious up-front work conducted to develop the evaluation framework, we expect that this work will take place concurrently with work on other tasks for the Southeast RTP.

The CS team will develop a project management plan and supporting quality control (QC) plan to meet the specific needs of this study. By following the procedures in these plans, many problems will be avoided altogether, and others will be caught and rectified before they become serious. Adhering to the study's aggressive schedule requires this type of approach. Our QC planning process will include clearly defined management and team roles, structured milestone meetings and deliverables, status updates and monitoring, ongoing technical review, and a document control system similar to the one we developed for MoveAZ.

Presentation material will be drafted for ADOT, TAC, and input team review for the work plan refinement meetings. We will prepare similar material for each subsequent ADOT and TAC meetings to be held over the course of the study.

Subtasks

- 1.1 Prepare the study's project management plan and QC plan to provide the CS team and ADOT with up-to-date tracking of technical work status, schedule, and budget adherence.
- 1.2 Conduct a kickoff meeting with ADOT and the TAC to better understand their perspectives on critical issues facing the region and to review the project work plan, schedule, and budget.
- 1.3 Refine the project work plan, schedule, and budget based on the comments from ADOT and the TAC.

- 1.4 Define members of the evaluation framework input team to develop the evaluation framework blueprint to include representatives of ADOT (Planning, Engineering, and Districts) and MPO/COG partners.
- 1.5 Conduct at least two meetings with ADOT and the evaluation framework input team to define the RTP evaluation framework blueprint including technical focus, process, products, and implementation plan. The blueprint will be defined early on in the planning process and will be the first product of the study other than the refined work plan.
- 1.6 Design the public and stakeholder involvement plan to meet the needs of ADOT and the TAC for this study. This plan will be prepared at this early stage to ensure that active public and stakeholder involvement is underway from the start of the study and that the appropriate level of stakeholder input is obtained for use in the study's planning process.

Products

- Final work plan, schedule, and staff requirements (budget) for the study;
- Draft and final evaluation framework and implementation plan;
- Project management, QC, and schedule adherence plan; and
- Final public and stakeholder involvement plan.

Task 2. Define Existing and Future Conditions

Objective

Compile available information and data, and prepare a summary of the existing conditions on all state highways within the study area and prepare a summary of existing and future conditions on and along the state highways. This analysis will provide input to the definition of state highway system needs and deficiencies, which will be documented in Working Paper No. 1.

Approach

Existing Conditions

The CS team will compile an overview of land uses, roadway conditions, travel data, crash history, traffic operations, access management, multimodal and alternative mode activities, socioeconomic conditions, and environmental regulatory requirements in sufficient detail that near-term route needs and deficiencies can be identified. Existing conditions data will be drawn from databases maintained by Federal, state, regional, and local agencies and completed and ongoing studies. Windshield surveys of all state highways will be

conducted to confirm information obtained through discovery, but only limited supplemental field data collection is anticipated for this task. Existing conditions and route-specific needs and deficiencies will be documented in Working Paper No. 1, Existing and Future Corridor Features.

Existing data will be compiled in the areas immediately adjacent to or on state highways within the study area. Land use information will be limited to those developments which impact state highway traffic operations and therefore may extend beyond the area immediately adjacent to the corridors. Socioeconomic data will be compiled for the entire region. The CS team will use GIS as the principal clearinghouse for all data. Inventory activities in this task will include obtaining:

- Land use information, including in-place and approved major commercial, industrial, and residential developments will be obtained from ADOT and local jurisdictions.
- Roadway conditions including number of lanes and lane geometrics, pavement and bridge sufficiency ratings, speed limits, major intersection traffic control, current daily traffic volumes, functional classification, bicycle suitability, AASHTO controlling design criteria report findings, and other relevant existing roadway data information will be obtained and organized in a GIS format. We anticipate that this information will come primarily from ADOT, PAG, SEAGO, and Pima, Cochise, and Santa Cruz Counties. The most recent HPMS data will be updated and refined to reflect current conditions and state highway video-logs will be obtained from ADOT. We will develop two sets of HPMS data – one that reflects current conditions, and a second that includes all committed projects in the study area, as identified in the current ADOT Five-Year Transportation Facility Construction Program. These data will be used as the basis for future needs and deficiency analysis as described in Task 3.
- Available travel data in the form of daily traffic and truck volumes will be gathered and displayed for the existing roadways in each corridor. Supplementary data collection needs will be evaluated and considered for implementation as necessary. The PAG regional travel demand model and Santa Cruz County model inputs, outputs, and documentation also will be collected and reviewed to support existing as well as future conditions analysis. Other travel demand models developed in the study area will also be reviewed.
- Available crash history data will be obtained from ADOT for the most recent available five-year period. Crashes will be summarized in data summary tables and crash location maps will be prepared using GIS. Corridor segments and major intersections will be evaluated using the average number of crashes per year and the crash rate (crashes per million vehicles of travel) for each intersection will be determined. Locations identified as having abnormally high numbers of crashes per year or abnormally high crash rates will be subjected to additional analysis to determine if an identifiable crash pattern exists. Near-term safety countermeasures will be recommended for locations identified as having an identifiable crash pattern.

- Traffic operations for existing conditions will be determined based on existing daily traffic volumes and roadway characteristics. Level of service will be documented for corridor segments and major intersections based on planning thresholds. Intersections, interchanges, and road segments which have unacceptable existing levels of service will be identified.
- Access management will be documented both from a policy standpoint (ADOT access permits) and a traffic operations standpoint. Relevant issues that will be addressed are type of crossroad and driveway access, frequency of access points, consistency of access design, crash history, and traffic volumes.
- Multimodal, ITS, and operational, and alternative modes will be identified, along the routes. Available information related to ITS and operational strategy, alternative mode routes, frequency, accessibility, capacity, and ridership will be summarized by mode type. Locations of any existing multimodal facilities along the corridors will be identified.
- Socioeconomic conditions will be evaluated both for the purpose of describing the intensity of existing and anticipated future development and to establish a database to conduct analysis necessary to address the Title VI and Environmental Justice requirements of Executive Order 12898. A description of existing and future development will be achieved by creating thematic maps using available PAG traffic analysis zone data and census tract data.
- Environmental data will be gathered from available databases and compiled using GIS overlays. The analysis will be conducted using the following existing environmental data such as topography, drainage, and floodways; cultural resources, protected wild-life and plant species; hazardous materials routes and sites; Native American communities; aircraft operations, parklands and open space; sensitive receivers for noise impacts; and prime, statewide, and other protected farm land soils.

Future Conditions

The CS team will compile a summary of future conditions to support identification of potential deficiencies for the state highway system. This task is intended to provide an overview of future land uses, programmed/planned roadway improvements, travel demand volumes, traffic operations, access management, multimodal and alternative mode needs, and socioeconomic conditions for 2030. All future conditions data resulting from this task will be included in Working Paper No. 1, Existing and Future Corridor Features.

As with the existing conditions analysis, GIS will serve as the primary analysis tool. Major analyses and activities will include the following:

- Programmed/planned roadway improvements will be identified from the ADOT Five-Year Construction Program and Transportation Improvement Programs from PAG; SEAGO; and Pima, Cochise, and Santa Cruz Counties.
- Travel demand volumes will be determined based on the outcome of a review of available model data obtained from PAG and coordination with ADOT.
- Traffic operations will be determined along the corridors based on 2030 conditions. This analysis will include the projected travel demand volumes and the programmed/□planned roadway improvements. A combination of available tools such as HPMS future forecasts and the outputs of the PAG regional travel model will be used to support this analysis. Level of service will be documented for corridor segments and major intersections. Locations in which level of service is determined to be unacceptable will be identified.
- Access management will be documented both from a policy standpoint and a traffic operations standpoint. Relevant issues that will be addressed may include type of crossroad and driveway access, frequency of access points, consistency of access design, and projected traffic volumes.
- Multimodal, ITS and operational, and alternative mode needs will be determined along the corridors. The future needs assessment will be based on planned expansion of current operations, historic use of existing alternative mode facilities, and overall trends in multimodal travel and ITS and operational strategy deployments.
- Socioeconomic conditions for future years will be evaluated both for the purpose of describing the intensity of existing and anticipated future development. A description of future development will be achieved by creating thematic maps using available ADOT; PAG; and Pima, Cochise, and Santa Cruz Counties census tract data.

Travel Demand Modeling

The CS team will develop an RTP travel modeling system to assess existing and future travel demand in the study area. This model will be used to develop improved future traffic estimates that will be a key component of the deficiency analysis in Task 3. The model will also support evaluation of alternatives in Task 5. Model development will consider integration of ADOT HPMS data, PAG regional travel modeling data, and a simplified network modeling process that will be used to feed into the HERS-ST-based evaluation framework. This modeling system will include base year development and future year projections and be used to prepare demand estimates to better understand the impacts of future project improvement alternatives. We will develop sketch planning tools that will integrate with the modeling system and evaluation framework to assess the performance of potential ITS, operations, and multimodal strategies.

GIS Data Management

A key requirement for this task is the effective compilation and management of information on existing and future conditions. Considering the number of potential sources of available data from multiple agencies and the data that will be need to be analyzed for more than 460 miles of state highways, the management of information will be crucial to the timeliness and efficiency of the study. The CS team will store information collected and created during the course of the study in a GIS. Using GIS and digital aerial mapping for each highway, existing information from ADOT, PAG, SEAGO, and other local sources can easily be incorporated with data collected or created during the course of this study. This GIS will be integrated with the evaluation framework and the modeling process to better understand travel demand impacts associated with needs/deficiencies and evaluations to be conducted later in Tasks 3 and 5.

Our team's experience with GIS is significant including CS' development of the MoveAZ GIS Decision Support Tool that automated the performance-based planning process of the MoveAZ Plan. Kimley-Horn also has significant experience with local GIS databases and has demonstrated their ability to successfully carry out projects using GIS as the central clearinghouse of data and an important analysis tool. Kimley-Horn's recent GIS experience includes the PAG Southeast Area Arterial Study, ADOT/MAG Compilation of Data for the CANAMEX Route Designation in the Maricopa Region, and the ongoing ADOT Corridor Evaluation for CANAMEX Designation Between I-10 and U.S. 93 Study.

Subtasks

- 2.1 Prepare an inventory and GIS database of existing information to be used to perform an analysis of existing transportation conditions. Evaluations of land uses, roadway conditions, travel data, crash history, traffic and ITS operations, access management, multimodal and alternative mode activities, socioeconomic conditions, and environmental regulatory requirements will be prepared to support later needs, deficiencies, and project evaluations in Tasks 3 and 5.
- 2.2 Prepare a similar inventory, GIS database, and analysis of future (no project) transportation conditions. It will include all the elements mentioned above in addition to an assessment of programmed/planned roadway improvements and projected forecast of socioeconomic and travel demand data. As with the previous subtask, this information will be used to support the analysis to be conducted in Tasks 3 and 5.
- 2.3 Develop existing and future HPMS base data to support analysis of deficiencies in Task 3. The future data will include all projects in the current ADOT five-year program to support analysis of conditions in 2015 and 2030.
- 2.4 Develop a Southeast RTP travel modeling system to assess existing and future travel demand, and to support the evaluation of alternatives in Task 5. The model will be integrated with ADOT HPMS data, PAG regional travel modeling data, and a simplified network modeling process that will be used to feed into the HERS/ST-based evaluation framework.

- 2.5 Develop a GIS-based database and management process for storing, using, and presenting information about existing and future conditions, as well as subsequent information and analysis to be prepared in later tasks. This GIS will be integrated with the evaluation framework and the modeling process to better understand travel demand impacts associated with needs/deficiencies and evaluations to be conducted later in Tasks 3 and 5.

Products

- Existing and future conditions GIS data layers and presentation material; and
- Working Paper No. 1, Existing and Future Corridor Conditions.

Task 3. Identify Future Needs and Deficiencies

Objective

Using the existing and future transportation conditions, document needs and deficiencies for 2015 and 2030 in the region and each corridor, and identify opportunities and issues for discussion with ADOT and at public involvement events.

Approach

The CS team will develop a framework to identify needs and deficiencies in the region. This process will be driven primarily by HERS-ST, an economic analysis tool that uses HPMS data and engineering standards to identify deficiencies on the transportation system, as well as potential solutions. The power of HERS-ST derives from the extensive research that is built into the algorithms of the program. The process for identifying deficiencies includes adapting HERS-ST for use in Arizona, developing deficiency thresholds, applying supplementary tools to identify non-highway and operational deficiencies, and producing documentation and maps that highlight key deficiencies in the study area.

Adapting HERS-ST for Arizona

The CS team has extensive experience using HERS-ST in Arizona and across the U.S. Having developed HERS to support national economic analysis for the FHWA, CS has been active in maintaining and expanding HERS to support state level analysis (HERS-ST) through projects in Oregon and Indiana. To use HERS-ST for Arizona, we recommend the following enhancements:

- **Sample vs. universe.** All states are required to submit HPMS data to the FHWA each year, including complete data for a sample of all state highways (and other public roads) and a select set of variables for all state highway segments. ADOT goes beyond most states by providing nearly complete data for all state highway segments. However, in its base configuration, HERS-ST will not recognize these data. The CS team

will adjust the Arizona HPMS data to ensure recognition of all HPMS highway segments.

- **Travel demand.** As part of Task 2, the CS team will be developing more detailed travel demand estimates for the Southeast region. These will be mapped to the HPMS roadway segments using the process developed as part of MoveAZ, including smoothing the data at urban area boundaries to ensure that the base and future traffic volumes are as accurate as possible.
- **Accident rates.** HERS-ST predicts accident rates using algorithms that capture traffic volumes, roadway geometrics, and other factors. These rates are based primarily on national research across a wide variety of conditions. The CS team will calibrate these rates to observed incident rates in the Southeast region. This will ensure that predicted accidents reflect local conditions.
- **Existing plus committed data.** The HPMS data used to support future deficiency analysis will include existing and committed projects. Committed projects include projects that are set for funding in the current ADOT Five-Year Transportation Facilities Construction Program. This will be built off the most current program (likely 2004 to 2009).

Deficiency Thresholds

As described in Task 1, the CS team will develop a template to help ADOT determine the appropriate analyses necessary to support all of ADOT's regional transportation profiles. As part of this template, the CS team will help develop Arizona-specific deficiency threshold tables, used by HERS-ST to determine when a particular segment of roadway is deficient on a number of factors. The deficiency tables include parameters for acceptable congestion, pavement condition, shoulder width, and numerous other factors. The CS team will also help ADOT develop a template for the deficiency threshold tables that will allow ADOT to develop the appropriate deficiency thresholds for future regional transportation profiles.

This template will identify appropriate deficiency levels to support both the Southeast RTP and other RTPs. The Southeast RTP study area includes a wide variety of areas, including portions of urbanized Tucson; growing areas off the interstate system, such as Sierra Vista; major border communities like Nogales; and substantial rural areas. Deficiency thresholds will be developed to reflect this diversity of conditions.

Deficiency Evaluation Framework

The CS team will develop a deficiency evaluation framework that uses HERS-ST as its base, but includes other tools and procedures to help ADOT capture the wide range of activities that affect the state highway system. Table 1.1 outlines several key types of investments made by ADOT, the types of issues these investments cover and potential

tools that can be used to help evaluate these investments. The CS team's evaluation approach will take into consideration each of these key areas, using available tools.

Using the deficiency thresholds developed for this study, the CS team will apply analytical tools such as HERS-ST, as well as IDAS, GIS spatial analysis, and the travel modeling system to fill out the framework to understand the needs and deficiencies on the future transportation system. This process will be used to develop a complete understanding of deficiencies in the region. We believe that this framework should also be closely tied to the performance-based planning framework develop for the MoveAZ Plan. Though the measures and tools may not be the same, the general planning factors (mobility, safety, etc.) will all be addressed in this framework. Table 1.2 provides examples of potential performance measures that can be used to identify deficiencies. These measures can be generated by tools such as HERS-ST or other tools and analysis conducted as part of this study.

The integration of local issues into the evaluation process will be an important element of all RTPs and could include qualitative as well as other quantitative tools and measures. In particular, we will identify and address key regional deficiencies and issues that the team is aware of and tools required to fully assess the transportation.

Table 1.1 Deficiency Areas for Evaluation

Program	Examples	Potential Tools
Preservation	<ul style="list-style-type: none"> • Resurfacing, rehabilitating, and replacing roadways • Bridge maintenance, rehabilitation, and replacement 	<ul style="list-style-type: none"> • HERS-ST • ADOT Pavement and Bridge Management Systems
Modernization	<ul style="list-style-type: none"> • Improving existing facilities • Capital expansion 	<ul style="list-style-type: none"> • HERS-ST • PAG and Santa Cruz County Models
Operations	<ul style="list-style-type: none"> • ITS and related deployments, • Crash rates and costs • User costs (out of pocket, pollution) 	<ul style="list-style-type: none"> • IDAS • HERS-ST
Multimodal	<ul style="list-style-type: none"> • Transit, bicycle/pedestrian, other 	<ul style="list-style-type: none"> • PAG and Santa Cruz County Models • ADOT Bike/Ped Plan

Table 1.2 Potential Performance Measures and Tools to Identify Deficiencies

MoveAZ Planning Factor	Measures of Deficiencies	Evaluation Tools
Mobility	Delay	HERS-ST
Reliability	Incident-based delay	HERS-ST
Safety	Crash rates	HERS-ST, ADOT crash rates
Environmental protection	Pollution costs	HERS-ST
	Emissions rates	IDAS, Mobile 6
Economic Vitality	Distance from national highway system	GIS spatial analysis
	Freight movement	HPMS truck percentages
Accessibility	Lack of access to jobs for Title VI populations	GIS Spatial Analysis

Report Needs and Deficiencies

The existing and future transportation conditions analysis and GIS inventories prepared in Task 3 will be linked to the adapted HERS-ST, deficiency thresholds, and evaluation framework elements to identify the transportation system needs and deficiencies for the Southeast RTP. Future needs and deficiencies will be prepared for all travel modes for both 2015 and 2030. We will use the GIS to prepare maps and data describing deficiencies and needs in the study area and associated data describing the specific issues on focus routes in the study area. Presentation and graphical material will be prepared to support Working Paper No. 2 and the public and stakeholder involvement events to be implemented in Task 4.

Subtasks

- 3.1 Adapt the HERS-ST for use in Arizona and the Southeast RTP, including developing a complete universe of HPMS data, generating updated traffic estimates from the travel demand modeling system developed in Task 2, calibrating accident rates, and related enhancements.
- 3.2 Develop thresholds for the Southeast RTP study area that will be used to determine deficient roadway segments and other transportation features. These thresholds will include HERS-ST deficiency tables as well as appropriate thresholds for other tools and analytical procedures.

- 3.3 Develop a performance-based process to identify needs and deficiencies for 2015 and 2030 based on HERS-ST and supplemented by additional tools and data. Integrate local needs and issues into this process.
- 3.4 Implement an approach to consider the entire state transportation system in the study area including all non-highway modes.
- 3.5 Report needs and deficiencies using the performance-based approach.

Products

- Working Paper No. 2, Project Deficiencies in the Southeast Region, 2015 and 2030; and
- HERS-ST deficiency tables for use in the Southeast RTP and a template to apply these tables for future profiles.

Task 4. Prepare Public and Stakeholder Involvement Program

Objective

Establish and conduct a public and stakeholder involvement plan that maximizes the participation of local residents, elected officials, businesses, and agency stakeholders and that educates, informs, and solicits feedback from participants for use in the planning process.

Approach

Public and Stakeholder Involvement Plan

As part of Task 1, the CS team will develop a detailed Public and Stakeholder Involvement Plan. Gordley will draw on its experience creating plans for numerous public involvement efforts in the study area, and will work closely with CS and ADOT to develop an effective and well-articulated plan. Development of the plan will occur in concert with the other efforts of the CS team. The plan will identify diverse groups of stakeholders and outline objectives and methods to gain meaningful public input and involvement in the study. The emphasis will be on assuring a broad and inclusive outreach effort, gaining useful input, and thoroughly documenting both the process and public comments on all issues.

Public and Stakeholder Outreach

To ensure that the outreach effort connects with members of the public and stakeholders, the CS team will create a detailed contact database, drawing upon Gordley's existing databases developed on numerous ADOT and local jurisdiction projects. The CS team will also access contact information and lists from other ongoing studies and projects.

Gordley's contacts and knowledge, especially along I-19 between Rio Rico Drive and Ruby Road and in the SR 189/B-19 area in Nogales, will provide for the most accurate and productive distribution of project information. More conventional sources adding specific property owners and residents can be utilized as well.

Our team's knowledge and working relationships with media throughout the study area will be employed to provide the type of local relevancy that will engage segments of the local populations that may not respond to standard public notices. By utilizing the information gathered in the MoveAZ Plan and our in-depth understanding of local contacts and issues, the CS team will gain additional exposure through local media outlets. Media coverage both before and after the public meetings will help increase the public's participation and its understanding of the goals of ADOT and the study.

All media contact will be coordinated and approved through the ADOT project manager, and Doug Nintzel and the appropriate personnel in ADOT's Office of Communication and Community Partnerships to ensure a correct and consistent message. Press releases will be drafted for general use, and then will be customized with local information most pertinent for each individual meeting. After issuing the press releases, the CS team will follow up with phone calls to encourage timely and informative media coverage.

Newsletters will provide clear and comprehensive information about the study and invite the public and stakeholders to participate. The CS team will work with ADOT to include all pertinent information and graphics. Gordley's success with numerous newsletters on related projects, and its ability to provide bilingual and bicultural communications, will ensure that a broad and respectful outreach effort is accomplished. Both print and electronic versions of the newsletters will be available to help maximize the reach of each issue.

The CS team will work with ADOT to develop a study specific web site or will provide content for a study page on ADOT's internal website. The CS team has developed numerous web sites, including the site for the MoveAZ Plan. This web site will be used to post electronic versions of selected study reports, documentation, and newsletters, identify the study's technical progress and outreach schedule, and support the public and stakeholder involvement process.

A variety of other efficient and cost effective methods will be utilized to broaden the public and stakeholder outreach, including adding information about the ADOT project to existing newsletters, web sites, e-mail lists, mailing lists, and publications accessible through our relationships with various groups. Gordley Design Group has contacts with local jurisdictions, community groups, special interest groups, homeowner associations, school districts, transportation-related groups, the traveling public, business and industry associations such as The Fresh Produce Association of the Americas, major area employers, healthcare providers, emergency service providers, and military representatives. Word-of-mouth communications through these types of groups can greatly increase local participation in the public meetings. Outreach will also be accomplished through the TAC

members' involvement and connections with their own constituencies, whether public or private.

Public Involvement Meetings

The CS team recommends three rounds of public involvement, beginning early in the process and connecting to key phases. The three rounds will include:

1. An initial set of stakeholder meetings designed to assess key issues in the Southeast RTP study area. These meetings will include transportation agencies, local and regional governments, major transportation providers, economic development agencies, and others organizations with knowledge of key issues in the study area. These meetings will include presentation of existing and future conditions as developed in Task 2 and will provide an opportunity for knowledgeable stakeholders to identify key issues for the deficiency and project prioritization analyses. Stakeholder meeting participants will be encouraged to participate in future rounds of public involvement.
2. A first set of public open house meetings will be held in conjunction with Task 3. These meetings will use information developed from the stakeholder meetings, as well as developed through the existing and future conditions (Task 2) and future deficiency (Task 3) analyses. These meetings will provide an opportunity to present deficiencies to the public and receive feedback on key issues. Up to five public open houses will be held at several key locations in the study area.
3. A second set of public open house meetings will be held in conjunction with Task 4. These meetings will build on the two previous rounds of public involvement and present the evaluation framework and potential projects identified in Task 4. This round of public involvement will provide an opportunity to draw a clear connection from existing and future conditions to identification of deficiencies to identification and evaluation of potential projects.

At the open house meetings, information will be conveyed through a variety of clear and comprehensive exhibits and handouts. Newsletters will be distributed, and members of the public will be able to discuss issues one-on-one with CS and ADOT team members. It will be especially important during the second round of public meetings to clearly explain what input was received during the first round of meetings, and how that input was incorporated into the study to shape the project's development.

Although similar types of information will be presented and also solicited from the public and stakeholders throughout the study area, it is important that the CS team customize its outreach methods for the diverse populations encompassed in the study area. Concerns and issues for the more rural portions of the study area will naturally be very different from those in the urban areas. Preferences for means of input will vary as well. The best way to be effective and remain consistent from meeting to meeting is to provide a variety of options to communicate the information, and provide choices for how each individual would like to provide input. Within an open house/information exchange format those

methods for input would include questionnaires, verbal discussions with notes taken by team members, and graphic displays and maps designed to encourage the public to add comments on sticky notes placed directly on areas of concern. The use of large pads for written comments can help promote the exchange of ideas and expression of opinions even though participants may be attending the meeting at different times.

Questionnaires can elicit both qualitative and quantitative information, such as general comments or questions asking people to rank issues based on their importance. Asking for the identification of the best attributes of a transportation system, along with asking for the worst deficiencies of the system, can produce more useful information than simply asking for the negatives. It is important to identify what is working best, as well as what is failing.

Appropriate locations for the open house meetings will be identified and utilized in each area. Sites will be easily accessible both geographically and in accordance with the Americans with Disabilities Act. All sites will be chosen to facilitate the free movement of members of the public and CS team members, which is vitally important in an open house format. The sites will be comfortable and well-lighted to provide the best atmosphere for conveying information about the project.

Gordley's bilingual public involvement specialists will be utilized at all meetings to help ensure the public's comfort and ease in communicating, whether in English or Spanish. The availability of special accommodations for other means of communication will be made clear in the press release and provided when requested.

Subtasks

- 4.1 Based on the detailed public and stakeholder involvement plan prepared in Task 1, prepare supporting plan elements including a compilation of diverse groups of stakeholder mailing lists and databases, scheduling of partnering events and newsletters, media coverage plans, methods to increase public and stakeholder participation including underutilized participants, and refinements of methods to gain meaningful public input and involvement in the study.
- 4.2 Prepare web content for the Southeast RTP either as part of the ADOT web site or as a stand alone site. The web site will be used to post electronic versions of selected study reports, documentation, and newsletters, identify the study's technical progress and outreach schedule, and support the public and stakeholder involvement process.
- 4.3 Implement the first round of public and stakeholder outreach, focusing on obtaining input on the study purpose, goals, and key issues in the study area. Early in the Southeast RTP, stakeholder meetings will be conducted with key agencies and organizations in the study area to present the analysis of existing and future conditions and receive feedback on key issues in the study area.

- 4.4 Implement the second round of public and stakeholder outreach, focusing on obtaining input on transportation system needs and deficiencies in the study area. Up to five public open house meetings will be conducted in conjunction with Task 3. Information will be prepared and presented in an easily understood format and be used to solicit meaningful input to accomplish the study's goals and increase its validity.
- 4.4 Implement the third round of outreach, focusing on obtaining input about potential future project solutions and strategies promoted by ADOT and the TAC. Similar partnering event methods will be implemented as with the second round of open house meetings.
- 4.5 To support all rounds of public involvement, prepare at least two Southeast RTP Study newsletters using a format and distribution process approved by ADOT. Newsletters will be user friendly, graphically oriented, and will convey summary information to the public and stakeholders.
- 4.6 Prepare the associated media and press material for each round of public involvement.

Products

- Summary Report 1 documenting the first round of public meetings, media coverage, mailing lists, and all stakeholder and public comments and responses;
- Summary Report 2 documenting the second round of public and stakeholder involvement; and
- Electronic version of the contact database.

Task 5. Develop a Program of Prioritized Projects

Objective

Identify potential projects for the Southeast RTP and develop a structured evaluation framework and related criteria linked to the needs and deficiency analysis and public involvement process to test the viability of proposed projects.

Approach

One of the key results of the RTP process will be potential projects for consideration in future statewide planning and programming. The RTP represents a first step in a planning process that includes developing a long-range transportation plan, programming, and project delivery. The Southeast RTP, and each of the other RTPs, will produce a list of potential projects that have been prioritized within the study region. These projects will

then be evaluated across the State as part of an update to the MoveAZ plan. We believe that it is vital that the RTPs follow the general performance-based planning guidelines developed in MoveAZ, including developing corridor level projects (or project bundles), developing thorough cost estimates for these projects, using performance measures to evaluate these projects, and developing a prioritized program of projects that reflects State concerns.

Identify Potential Projects

Potential transportation options will be developed for individual corridors in the Southeast RTP study area, as well as the entire system. Using the sources noted below, as well as additional information gathered through the course of the study, we will develop a detailed assessment of available options that will include highway, multimodal, and freight infrastructure improvements.

- **Adapted HERS-ST.** In addition to identifying deficiencies, HERS-ST suggests potential projects to remedy deficient conditions. HERS-ST can identify these projects using minimum cost effectiveness criteria (e.g., projects that have a benefit/cost ratio greater than one) or conduct a full engineering needs analysis that identifies all projects required to eliminate deficient roadways.
- **District Engineers.** In previous corridor profiles, ADOT district engineers played a key role in identifying projects. It will be very important to continue the district engineer's role in these efforts as they have the most information about local conditions. We propose to provide the district engineers with key output from HERS-ST and other tools to ensure that potential projects meet a basic standard of reasonableness.
- **Congestion management strategy database.** ADOT has developed potential congestion mitigation strategies as part of a congestion management system (CMS) developed by CS and other firms. The database will be keyed to specific variables to identify potential strategies to reduce deficiencies identified in Task 3. Strategies contained in this database, including the supporting analytical tools and data, consider access management, ITS and operational, intermodal and freight, transit and transportation demand management, among others.
- **Other strategy databases.** Additional strategy databases will be developed as part of creating a template for ADOT's regional transportation profiles. These strategies will cover such areas as operational improvements, ITS deployments, and multimodal investments. The strategy databases will help ADOT identify if a particular strategy is appropriate for consideration in a particular region or on a particular roadway. The strategies will respond to key information – particular types of deficiencies – and be keyed to other information. For example, on-demand transit service may be a useful strategy for concentrations of elderly and disabled residents. Census data can be used as a screen to identify the need for such a strategy. Other factors will be used in a similar way to key particular strategies.

- **Public involvement suggestions.** The transportation options and alternatives workshops will provide an opportunity for the public and stakeholders to engage planning concepts and potential options identified by ADOT and the consultant team and to suggest key concepts of their own.

Using the process developed as part of MoveAZ, these individual project elements will be bundled into larger corridor-level projects that capture potential long-term investments. The bundling process ensures that the tools capture the performance impacts of projects in the study area. The process uses a set of decision guidelines and will include review of project bundles by key knowledgeable staff, such as the District Engineers in the study area.

Develop Cost Estimates

To support the prioritization and cost-effectiveness assessments of projects, it is important to develop thorough and complete cost estimates. Though the RTPs are planning studies, we believe that it is important that the cost estimates be as thorough and accurate as possible. Several of the tools used for the Southeast RTP provide rough cost estimates of major investments. For example, IDAS includes costs of major ITS deployments, and HERS-ST includes cost information for a wide variety of highway investments. These cost templates will be updated with local information, based on recently completed work by ADOT in the study area. The cost estimates will reflect variation in conditions, such as terrain, and will be estimated separately for key components, such as construction, right-of-way, and other related costs. Kimley-Horn will be responsible for developing these costs based on sound engineering judgment. District engineers will also have an opportunity to review these costs.

Develop and Apply Evaluation Framework

The CS team will develop a performance-based evaluation framework that uses HERS-ST as its base, but includes other tools and procedures to help ADOT capture the wide range of activities that affect the state highway system. This key sketch planning and related tools to be used as part of this process include:

- HERS-ST forms the basis of the evaluation approach. HERS-ST includes multiple performance measures and estimates the costs and benefits of potential projects. Major planning factors addressed by HERS-ST include mobility, safety, reliability, cost effectiveness, environmental protection, and others.
- ADOT management systems will provide a key additional set of tools for preservation issues, as well as safety. Two major systems can be used to estimate the benefits of pavement and bridge rehabilitation and replacement strategies. ADOT also has a safety management system that will evaluate the benefit of key systemwide projects, such as improved guard rail treatments.

- The travel modeling system developed for the Southeast RTP, as well as the PAG and Santa Cruz County travel models, will provide useful information to supplement HERS-ST and other tools. In addition to providing improved estimates of traffic volumes that are essential to operate HERS-ST, a travel modeling system can provide key information about potential route diversion and related issues that will impact the performance of a given system. They can also be used to assess multimodal strategies and projects as appropriate to the region.
- IDAS provides both a set of ITS and operational strategies, as well as evaluations of specific ITS deployments. IDAS can be used as a stand alone tool, or pieces of IDAS can be used to support HERS-ST and travel modeling tools.
- GIS provides a means to calculate spatial attributes and evaluate the impacts of investments on certain population groups in the study area. Key issues that can be evaluated include access to jobs, connection to the national highway system or other major facility for growing population areas, and others.

A final set of evaluation tools will be selected through consultation with ADOT and the Southeast RTP TAC, as well as through the process to develop a blueprint for all 12 RTPs.

The evaluation framework will also be consistent with the performance-based planning direction set by the MoveAZ plan. We propose to develop an evaluation system that compares potential projects to a future base system performance scenario for both 2015 and 2030. For the Southeast RTP, these future scenarios will reflect expected investments in the Southeast region, traffic volumes appropriate to the particular year, and will include all state highways in the study area.

The CS team will develop a complete list of candidate measures as part of the blueprint process described above. We will work with ADOT to select the appropriate measures and tools for the Southeast RTP that reflect the conditions of the study area. Many of these measures will be calculated by HERS-ST, which addresses issues such as mobility, environmental protection, safety, preservation, and others. When supplemented by additional tools and knowledge, a thorough performance analysis of each major project can be conducted. Some of the key issues to be addressed in the evaluation framework, consistent with MoveAZ, include:

- **Mobility and Reliability.** The CS team will analyze potential impacts to delay and incident delay that result from the projects. These measures can be captured by HERS-ST and supplemented, if necessary, by tools such as IDAS.
- **Accessibility.** The CS team will identify expected improvements to access the state transportation system and measure the impact of potential projects on Title VI populations. These issues could include analysis of changes in heavy truck trips, improved access to employment, and other similar analyses. HPMS data, socioeconomic data, and a GIS-based analysis can be used to identify these impacts.

- **Economic Vitality.** The CS team will analyze the cost effectiveness and economic benefits of each project. HERS-ST is an economic analysis tool, estimating the dollar value of user, crash, and pollution costs. In addition, economic analysis of freight traffic will be a key component of this analysis.
- **Preservation.** The CS team will identify both the short- and long-term preservation benefits of strategies. ADOT's existing management systems can identify short-term (five year) benefits of repaving and bridge maintenance. As ADOT migrates to Pontis over the next several years, longer-term benefits of bridge maintenance can be identified. Long-term pavement impacts can be identified from local estimates of average pavement life and replacement costs.
- **Safety.** The CS team will evaluate the impacts of new facilities on the safety of the transportation system. We will use HERS-ST to identify expected changes to crash rates, injuries, and fatalities on state highways in the study area. These will be calibrated to actual crash rates in the Southeast region.
- **Resource Conservation.** The CS team will evaluate the impacts of projects on environmental issues, including pollution costs and, potentially, emissions rates. HERS-ST estimates pollution costs. Other tools, such as Mobile 6 and IDAS can be used to estimate emission rate impacts.

The evaluation will produce a matrix of projects by performance measures and factors identified in the evaluation approach. The matrix will include performance results, cost estimates, and other information.

Develop a Prioritized Program for the Southeast Region

The CS team will work with ADOT to build the individual project evaluations into a draft prioritized program of projects for the Southeast RTP. The program will be organized by three types of roads – interstate, NHS, and non-NHS roads – because these reflect Federal funding categories.

Subtasks

- 5.1 Identify candidate projects, including competing alternatives for some routes, based on existing databases of strategies, and tools, district engineer review, and public and stakeholder suggestions.
- 5.2 Develop a method for developing consistent and accurate cost estimates for all projects in the study area. These estimates will reflect the variety of conditions, such as terrain, and cover all key components of project costs including construction, right-of-way, and others.
- 5.3 Identify key sketch planning analysis tools to evaluate highway, operations, and alternate mode projects in the region. HERS-ST will be the primary tool, but will be

supplemented by other tools as appropriate to the issues in the Southwest RTP study area.

- 5.4 Refine the evaluation approach used to identify needs and deficiencies in Task 3 to be used in the evaluation and prioritization of projects. Develop and apply performance measures using the tools identified. Compare the system performance of potential investments to future base scenarios for both 2015 and 2030.
- 5.5 Identify a priority list of projects with all of their components and costs by major type of road.

Products

- Strategy databases for congestion, operational, and related activities to help alleviate deficiencies;
- Evaluation methodology and template for use in future regional transportation profiles; and
- Working Paper No. 3, Southwest Region Program of Prioritized Projects.

Task 6. Draft and Final Reports

Objective

Prepare the Draft and Final Reports that synthesize the technical analysis, partnering events, and products generated during the course of the study. An executive Summary will also be provided in a format agreed upon by ADOT.

Approach

The CS team will prepare the Draft Report by integrating the results of Working Paper Nos. 1, 2, and 3 and the summary reports for both rounds of the public and stakeholder involvement process. These outputs will form the core of the Draft Report and include detailed information about the evaluation framework; existing and future conditions; needs and deficiencies analysis; public and stakeholder input on issues and project options; recommended project priorities and strategies; and recommended future planning, engineering, and environmental analysis needs. An Executive Summary and presentation material that further distills the information contained in the Draft Report also will be prepared for the public, stakeholders, agency staff, and the State Transportation Board.

Based on our experience with the MoveAZ Plan and other similar studies, we will prepare the Draft Report early enough in the schedule to allow for at least three months of review and comment by ADOT and the TAC. This schedule will allow ample opportunity for

ADOT and the TAC to provide thorough and thoughtful comments on the Draft Report for finalization. We will work with ADOT and the TAC to incorporate the appropriate level of comments generated in this review and comment period to prepare the Final Report and associated Final Executive Summary. We will provide ADOT with a Board presentation that represents the study findings, recommendations, and future transportation analysis needs.

The CS team will prepare PDF and electronic versions of the Draft and Final Reports, as well as all supporting working papers, memoranda, and information for transfer to ADOT. The Final Report and applicable technical memoranda and material also will be posted on the web site. Figure 1.2 shows the proposed schedule for the study.

Subtasks

- 6.1 Work with ADOT and the TAC to determine and finalize the format of the Draft and Final Reports and Executive Summary.
- 6.2 Prepare and submit both the Draft Report and Draft Executive Summary to ADOT and the TAC for their review and comment.
- 6.3 Upon receipt of ADOT's and the TAC's review and comment, the CS team will prepare the Final Report.
- 6.4 Prepare Draft and Final Report presentation material for ADOT to present the study's findings and recommendations to the State Transportation Board, and in particular, to obtain Board approval of the study and its potential future planning, engineering, and environmental steps.

Products

- Prepare 40 copies of a Draft Report and Executive Summary for ADOT and the TAC;
- Prepare 40 copies of the Final Report and Executive Summary for ADOT and the TAC;
- Provide ADOT with a reproducible, camera ready copy of the Final Report and Executive Summary on 50 Compact Disks (CDs);
- Provide "web-ready" versions (in PDF format) of each Final document by task; and
- Board presentation material for both the Draft and Final Reports.

Figure 1.2 ADOT SE RTP Schedule

